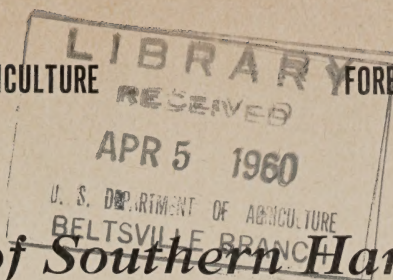


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Butt Rot of Southern Hardwoods

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Butt rot is the most serious cause of cull in southern forests. Millions of board feet of southern hardwood timber are lost every year to the ravages of such rot. It is present throughout the South in all hardwood species. Probably 40 percent of the hardwoods being cut in the bottom lands of the Mississippi River have butt rot. In one study in the Mississippi River bottoms, butt rot was found in 83 percent of the sugarberry trees being harvested by commercial loggers, in 56 percent of the sweetgum, 36 percent of the white oaks, 34 percent of the soft elms, and 26 percent of other species.

Butt rot is any decay at the base of a living tree. Only in the heartwood, however, does it cause extensive damage. As most of the fungi which cause rot enter through wounds in the bark, butt rot is most prevalent in stands which have been heavily and repeatedly

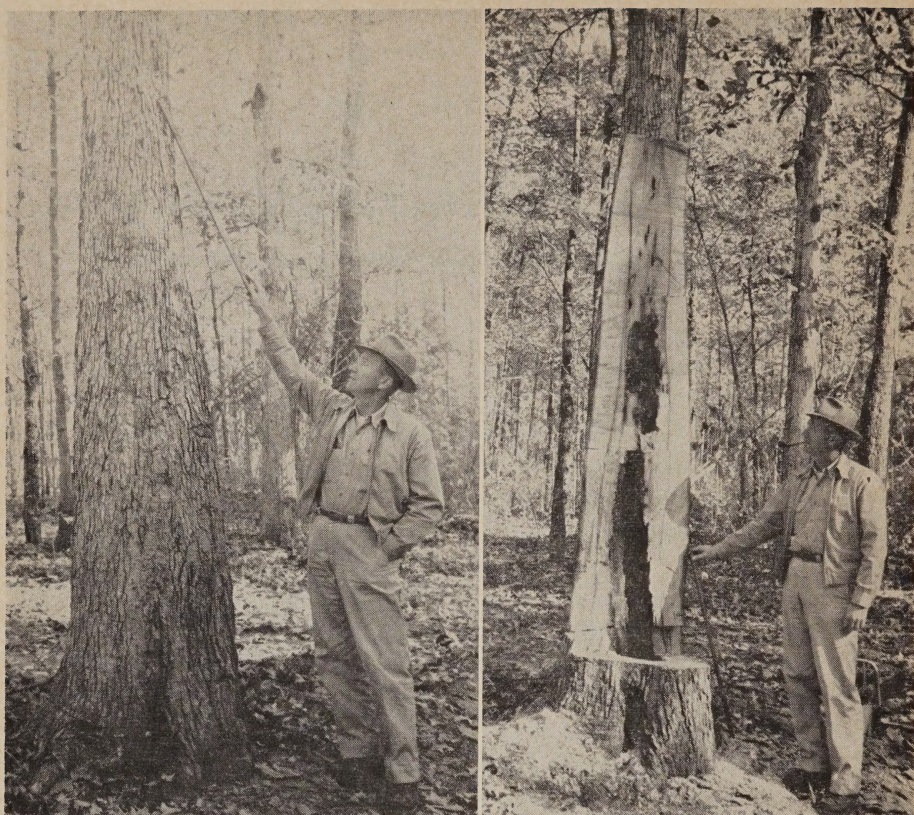
wounded. About 80 percent of the infections start at fire wounds, most of the rest at injuries made during logging operations.



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FIGURE 1.—Large old wound on water oak, hollowed out by butt rot.

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FIGURE 2.—Left, Old scar on swamp chestnut oak with butt bulge. Pointer indicates upper limits of visible decay. Right, Same tree cut open to show the extent of rot.

Symptoms

Reliable indicators of butt rot are old wounds, either open or healed (fig. 1); hollows and abnormal swelling or butt bulge (fig. 2); and conks or other fruiting bodies (fig. 3). In the South fruiting bodies often go unnoticed because of their short life, small size, or hidden location, or because they may not be formed until after the diseased tree dies.

The rotted wood may be soft, white and spongy, stringy, friable, or brown and brittle. The rotted

core may be only a few inches in diameter, or it may include the entire heartwood. It may extend a few or many feet above the wound. Diseased trees, being weakened structurally, may break in wind and ice storms.

Cause

Butt rot is caused by fungi of the genera *Polyporus*, *Fomes*, *Stereum*, *Poria*, *Pleurotus*, and some others. More than 30 fungi have been isolated from butt rot in southern hardwoods, but 5 species

cause nearly half of the infections. These are *Pleurotus ostreatus*, *Hydnum erinaceus*, *Polyporus fissilis*, *Polyporus sulphureus*, and *Polyporus lucidus*. Certain fungi tend to occur more frequently on some tree species than on others. Generally, only one fungus is responsible for butt rot in the heartwood of an individual tree.

Life History

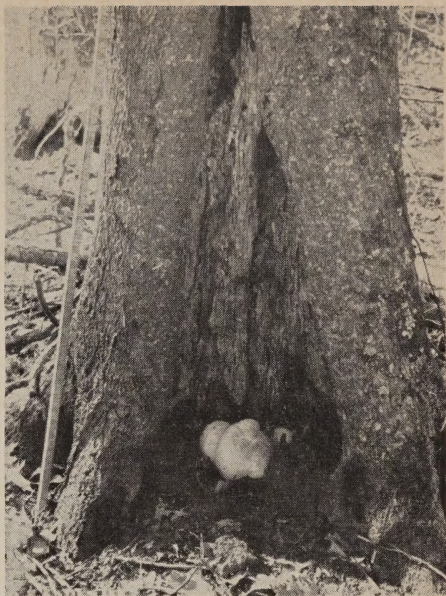
Rot fungi produce great numbers of microscopic spores that fall from the lower surface of their conks. These spores, borne by the wind, infect exposed wood soon after a tree is wounded. After the sapwood has been penetrated the fungus either continues into the heartwood or is succeeded by species of heart rot fungi. Eventually new conks are formed.

Rot develops at rates that vary both with the fungus and the host. The average extent of rot above scars for various southern hardwoods is—

	20 years after wounding (feet)	40 years after wounding (feet)
Overcup oak and sugarberry---	4.1	6.1
Sweetgum and elms-----	3.6	5.7
Red oaks-----	2.7	5.4
Green ash-----	3.4	5.1
Water hickory--	1.1	4.4

To these figures, the height of the scar must be added to give the total height of rot.

The rate at which heartwood decays is influenced most importantly by the size and age of the wound through which the fungus



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FIGURE 3.—*Hydnum erinaceus* conk at base of old fire wound on Nuttall oak.

entered. Wounds 2 inches or less in width usually do not develop noticeable rot. Little loss in wood volume is associated with wounds that are less than 4 years old, regardless of their size. Most extensive decay occurs behind large, old wounds.

Control

Since almost all infections occur through wounds in the bark, the most practical control is the prevention of injuries. Elimination of forest fires alone could vastly reduce butt rot in southern hardwoods.

Trees rendered worthless by rot (fig. 4) should be deadened so that sound trees can replace them. Infected trees that still have value confront the owner with the prob-



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FIGURE 4.—Butt rot has made the lower portion of this overcup oak tree valueless for lumber manufacture.

lem of deciding whether they should be salvaged immediately or whether they can be kept in the stand for a time. Guides for reaching a decision will be found in Technical Bulletin 1189 (see References). Among the considerations that favor early salvage are that the best or most valuable lower log of the tree is rotting, that wind or ice may break the tree, and that degrade from stain and insect attack may increase the loss.

References

- DECAY FOLLOWING FIRE IN YOUNG MISSISSIPPI DELTA HARDWOODS. G. H. HEPTING. U.S. Dept. Agr. Tech. Bul. 494, 32 pp., illus. 1935.
- FIRE AND DECAY INJURY IN THE SOUTHERN BOTTOMLAND HARDWOODS. F. H. KAUFERT. *Jour. Forestry* 31: 64-67. 1933.
- DECAY AFTER FIRE INJURY TO SOUTHERN BOTTOM-LAND HARDWOODS. E. R. TOOLE. U.S. Dept. Agr. Tech. Bul. 1189, 25 pp., illus. 1959.
- HEART ROTS IN LIVING TREES. W. W. WAGENER and R. W. DAVIDSON. *Bot. Rev.* 20: 61-134, illus. 1954.